

DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON

Letter
Circular
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"MAGNETIC INSULATORS"

This Bureau receives frequent inquiries regarding the possibility that there may be some substance which is an insulator with respect to a magnetic field in the same sense that certain materials are insulators with respect to an electric current. There is no known substance which has this property. This can readily be understood when it is remembered that a magnetic field is a condition in the space surrounding an electric current or a magnetized body and not a movement of particles of matter.

In certain instances it is possible to reduce the intensity of the magnetic field in a given space due to currents or magnets by "magnetic shielding". This consists in surrounding the given space by iron or other ferromagnetic material. Within such an inclosure, the intensity of the magnetic field arising from sources outside the inclosure is somewhat less than it would be without the shielding medium. The action in this case is not a stopping or insulation of the magnetic field but a concentration of the field in a medium of higher permeability. The amount of shielding depends upon the magnetic permeability of the shield and its thickness. Magnetic shielding on a large scale or against intense fields is generally not feasible.

